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January 1990

Wastewater and Solid Waste Management Practices at Federal Facilities in Saskatchewan: An Environmental Evaluation

Report CP(EP)WNR 90-91-2

ABSTRACT

Wastewater and solid wastes practices at 41 locations under federal jurisdiction in Saskatchewan were reviewed in 1989 to identify deficiencies and to recommend improvements where necessary. The evaluations were subjectively performed, using available information from site inspections or interviews. Only one wastewater system was found to pose a serious environmental concern, and it should be upgraded immediately to meet federal effluent quality guidelines. Another 13 need to be monitored to verify their satisfactory compliance rating. Solid waste management practices need to be improved at six locations. Although these solid waste deficiencies do not currently pose serious environmental or public health concerns, such concerns may arise in the future if improvements are not made.

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1. INTRODUCTION

It is the policy of the federal government to provide a consistent and exemplary environmental pollution control program with respect to its own activities, and thereby offer leadership in the nation-wide effort to protect and enhance the quality of the Canadian environment. As a result of this policy, Environment Canada develops guidelines and codes of good practice for assisting federal departments in the implementation of this policy. The federal government's commitment to pollution control within its jurisdiction was strengthened with the passage, in June 1988, of the Canadian Environmental Protection Act (CEPA). Under this Act, Environment Canada is developing regulations that will govern wastewater, solid waste, and other practices at federal establishments. Some of these regulations are scheduled to be promulgated in 1991.

In addition, a federal regulatory instrument applicable to pollution control initiatives is the "Environmental Assessment and Review Process Guidelines Order," issued as an Order-in-Council under the Government Organization Act in June 1984. Under this Order, all initiatives undertaken by Federal Departments must be evaluated by the initiating department early in the planning process to ensure environmental implications are fully evaluated. This applies to pollution control initiatives for sewage and solid waste management. An explanation of this evaluation process is

described by The Federal Environmental Assessment and Review Process (1987).

The purpose of the survey of wastewater and solid waste practices under federal jurisdiction in Saskatchewan was to: assess the level of compliance with current guidelines and codes; to recommend improvements where appropriate; and to identify major facilities that may be subject to the impending CEPA regulations for wastewater and solid waste management. This survey, conducted in 1989, reviewed 41 federal locations, involving the following federal departments and agencies: Agriculture Canada; Correctional Service Canada; Energy, Mines and Resources Canada; Environment Canada; National Defence; Revenue Canada; Royal Canadian Mounted Police; and Transport Canada. Wastewater and solid waste practices on Indian Reserves in Saskatchewan, previously reported on by Harrison et al. (1989), were not included in the survey.

2. COLLECTION AND EVALUATION OF DATA

Most of the wastewater and solid waste systems were inspected by Environmental Protection staff during mid-1989. Medical Services of Health and Welfare Canada provided information on the Revenue Canada sites. Information was also obtained by telephone for those systems that were small or remotely situated. The evaluation of all systems was subjectively performed as environmental samples were not

collected.

Wastewater systems were evaluated using the following federal guidelines: "Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments" (Environment Canada, 1976). Solid waste systems were evaluated using the following federal codes: "Code of Good Practice on Dump Closings or Conversion to Sanitary Landfill at Federal Establishments" (Environment Canada, 1977) and "Code of Good Practice for Handling Solid Wastes at Federal Establishments" (Environment Canada, 1978).

Wastewater and solid waste systems were generally small, serving only a few buildings. Domestic systems were excluded with the exception of those serving customs stations of Revenue Canada, due to their proximity to the international border.

3. RESULTS AND DISCUSSION

The main purposes of sewage and solid waste systems are to collect, treat, and dispose of liquid and solid wastes in a manner that protects public health and the environment. The survey addressed the adequacy of the systems to meet these objectives.

3.1 Wastewater Compliance

A total of 54 wastewater systems at 41 locations was investigated (Appendix 1). Twelve systems are connected to municipal systems, which are subject to provincial regulations. These twelve contribute minor loadings to their municipal systems and no problems are anticipated as a result. Of the remaining 42 systems under federal jurisdiction, the system serving Canadian Forces Detachment (CFD) Dundurn is the only one that does not meet the federal guidelines.

Wastewater at CFD Dundurn flows through a septic tank-disinfection system before it is discharged into Beaver Creek. This treatment is inadequate since Beaver Creek has little dilution capacity, particularly when the population of the detachment approaches 1500 in the summer. Moreover, monitoring over the past ten years by Environment Canada has shown that the effluent quality does not comply with the federal guidelines. This treatment system poses a serious environmental concern, and it should be brought into compliance immediately.

Eleven of the remaining 41 systems require inspection to ensure lagoon seepage or land disposal methods do not cause environmental problems. These 11 systems are rated in Appendix 1 as conditionally satisfactory (Yes*).

The types of systems in Appendix 1 are summarized in Table 1. Only two of the systems are large: the primary treatment system at CFD Dundurn and the multi-cell lagoon at Prince Albert National Park. The balance are smaller in scale, comprised mostly of spray jet and subsurface disposal systems.

TABLE 1 WASTEWATER TREATMENT CATEGORIES

System Type	Number
holding tank(s)	8
single cell lagoon	4
multi-cell lagoon	2
mechanical plant	1
primary treatment	2
spray jet	11
subsurface disposal	14
tie-in to municipal system	12
Total	54

Spray jets were all assigned a satisfactory rating; however, their use for other than single dwellings on a parcel of land containing at least 16 hectares is not permitted under the supplement to the Saskatchewan Public

Health Act (1977). In future, spray jets should only be installed in accordance with this Act.

Subsurface disposal of sewage, consisting mostly of mounds and tile fields, was the most trouble-free of the systems shown in Table 1, and none of the 14 sites in this category posed a problem.

Present indications are that the CEPA wastewater regulations will apply only to large systems with a surface discharge; therefore, many small systems in Saskatchewan could be excluded from these regulations.

3.2 Solid Waste Compliance

A total of forty-one systems was investigated (Appendix 2). Thirty-two involve solid waste disposal to municipal sites. Since these municipal sites are subject to provincial jurisdiction, they were not evaluated. Although no serious environmental problems were noted with the remaining nine systems, six should be improved by: eliminating open barrel burning; redirecting discarded pesticide containers to designated collection centers; implementing proper site abandonment practices; and by banning the disposal of PCB containing fluorescent light ballasts in dumps. These ballasts contain small quantities of PCBs. Environment Canada recommends the secure storage and labeling of these ballasts once they are taken out of service (Environment

Canada 1986).

Solid waste management systems subject to federal jurisdiction in Saskatchewan, with the exception of those previously identified on Indian reservations (Harrison et al. 1989), generally receive small quantities of waste. Nevertheless, some sites in Appendix 2 may have to be improved if the proposed CEPA regulations for solid waste apply to small sites relative to: 1) site setback distances from buildings, wells, and surface waters; 2) site access restrictions (e.g. fencing); 3) onsite segregation of waste types; and 4) disposal restrictions for select wastes.

4. RECOMMENDATIONS

Each federal department should undertake the following recommendations where applicable:

1. Immediately bring into compliance the wastewater treatment system at CFD Dundurn;

2. Inspect the eleven wastewater systems that are a potential concern, and upgrade any found deficient;

3. Upgrade solid waste practices at six locations;

4. Ensure all future initiatives for pollution control are evaluated for environmental implications under the

Federal Environmental Assessment and Review Process and inform Environment Canada of the evaluations; and

5. Consult with Environment Canada on proposed large pollution control systems to ensure that applicable guidelines and the impending CEPA regulations will be met.

5. REFERENCES

Environment Canada. 1976. "Guidelines for effluent quality and wastewater treatment at federal establishments." Report EPS 1-EC-76-1.

Environment Canada. 1977. "Code of good practice on dump closings or conversion to sanitary landfill at federal establishments." Report EPS 1-EC-77-4.

Environment Canada. 1978. "Code of good practice for handling solid wastes at federal establishments." Report EPS 1-EC-78-7.

Environment Canada. 1986. "Identification of fluorescent lamp ballasts containing PCBs." Report EPS 2/CC/2.

"Environmental Assessment and Review Process Guidelines Order," June 22, 1984. Canada Gazette Part II, Vol. 118, No. 14, 2794-2802.

Federal Environmental Assessment Review Office. 1987. "The Federal Environmental Assessment and Review Process." Supply and Services Cat. No. En 106-4/1987.

Harrison, J.T., Waite, D.T., and Bonish, T. 1989. "Community wastewater and solid waste practices on Saskatchewan Indian reserves." Environment Canada, Report CP(EP)WNR 88/89-7, 33 p.

APPENDIX 1

AN EVALUATION OF WASTEWATER PRACTICES

FACILITY (LOCATION)	SYSTEM TYPE	FACILITIES SERVED	SURFACE DISCHARGE	SATISFACTORY COMPLIANCE STATUS	RECOMMENDATIONS/ COMMENTS
AGRICULTURE CANADA					
Experimental Farm (Indian Head)	-[1]	All buildings	-[2]	-[2]	-Served by the Town of Indian Head sewage system
Shelterbelt (Indian Head)	2 cell lagoon	Administration bldg., 8 shops and 3 labs	No	Yes*	-Cut berm vegetation -Check for seepage -Water added in fall to prevent inlet freeze-up
Melfort Research Station	1 cell (lined?) lagoon	All buildings	No	Yes*	-Lagoon overgrown/unattended -Check for seepage
	1 cell lagoon-land disposal	Receives surface run-off around feedlot	Yes	Yes*	-Ensure land disposal is not a problem -Check for seepage
	1 cell lagoon-land disposal	Receives surface run-off around cattle shelter	Yes	Yes*	-Ensure land disposal is not a problem -Check for seepage
PFRA South Sask. River Project (located at Cutbank)	Subsurface disposal	Office, garage	No	Yes	
Regina Research Station	-[1]	All buildings	-[2]	-[2]	-Served by the City of Regina sewage system
Sask. Irrigation Development Centre (located near Outlook)	-[1]	Laboratory, office bldg.	-[2]	-[2]	-Effluent pumped to Town of Outlook sewage system
Scott Experimental Farm (Near town of Scott)	1 cell lagoon	2 homes, office, lab. and shed	No	Yes*	-Check for seepage -Water added in fall to prevent inlet freeze-up
Swift Current Research Station	-[1]	All buildings	-[2]	-[2]	-Served by the City of Swift Current sewage system

1 See Comments
2 Not evaluated/applicable
* Confirm compliance status (see text)

FACILITY (LOCATION)	SYSTEM TYPE	FACILITIES SERVED	SURFACE DISCHARGE	SATISFACTORY COMPLIANCE STATUS	RECOMMENDATIONS/ COMMENTS
CORRECTIONAL SERVICE CANADA					
Prince Albert Penitentiary	-[1]	All buildings, abattoir	-[2]	-[2]	-Served by the City of Prince Albert sewage system -Approx. 70 cattle and 90 hogs slaughtered monthly -Expansion of abattoir is planned
ENERGY, MINES AND RESOURCES					
Prince Albert Satellite Tracking Station (West of Prince Albert)	Subsurface disposal	lab bldg.	No	Yes	
	Holding tank-disposal contractor	Photofinishing lab	No	Yes	
ENVIRONMENT CANADA					
Batoche National Historic Park	RBC[3]-subsurface disposal	Visitor reception centre, maintenance bldg.	No	Yes	-RBC is four years old
Cree Lake Weather Station	Subsurface disposal	Office, garage 4 homes	No	Yes	
Fort Walsh National Historic Park (located south of Maple Creek)	Subsurface disposal	Visitor reception centre	No	Yes	
	Holding tank-land disposal	Outdoor chemical toilets	Yes	Yes*	-Ensure land disposal is not a problem
	3 Holding tanks-land disposal	Fort-public washrooms, officers' mess, superintendent's residence	Yes	Yes*	-Ensure land disposal is not a problem
	1 Holding tank-land disposal	maintenance compound	Yes	Yes*	-Ensure land disposal is not a problem

1 See Comments
2 Not evaluated/applicable
3 Rotating Biological Contactor
* Confirm compliance status (see text)

FACILITY (location)	SYSTEM TYPE	FACILITIES SERVED	SURFACE DISCHARGE	SATISFACTORY COMPLIANCE STATUS	RECOMMENDATIONS/ COMMENTS
ENVIRONMENT CANADA (continued)					
Fort Battleford National Historic Park	Subsurface disposal	Visitor reception centre, admin. office	No	Yes	
Motherwell Homestead National Historic Park (near Abernethy)	Subsurface disposal	Visitor reception centre, park office	Yes	Yes	
	Subsurface disposal	concession trailer	No	Yes	
Prince Albert National Park	3 cell lagoon	Town of Waskesiu, campground	Yes	Yes*	-Treated sewage flows adjacent to campground -Check for seepage -Check proximity of effluent to campground and isolate if necessary
Webb National Wildlife Area (located near Swift Current)	.1	.2	.2	.2	-Facility closed to public
NATIONAL DEFENCE					
CFD Dundurn	primary treatment-chlorination	Base facilities	Yes	No	-Upgrade to secondary treatment -2 cell lagoon has been proposed
CFB Moose Jaw	.1	.2	.2	.2	-Served by the City of Moose Jaw sewage system
REVENUE CANADA					
Big Beaver	Subsurface disposal	Office	No	Yes	
	Spray jet	1 home	Yes	Yes	-Provincial setback criteria from buildings is 30 m. Jet is located 25 m from building

1 See comments
2 Not evaluated/applicable
* Confirm compliance status (see text)

FACILITY (location)	SYSTEM TYPE	FACILITIES SERVED	SURFACE DISCHARGE	SATISFACTORY COMPLIANCE STATUS	RECOMMENDATIONS/ Comments
REVENUE CANADA (continued)					
Carievale	Spray jet	Office	Yes	Yes	
	Spray jet	2 homes	Yes	Yes	
Climax	Spray jet	Office, 1 Home	Yes	Yes	
Coronach	Spray jet	1 home, 1 house trailer, office	Yes	Yes	-Provincial setback criteria from buildings is 30 m. Jet is located 25 m from building
Estevan	Subsurface disposal	Office	No	Yes	
Monchy	Spray jet	Office, 2 Homes	Yes	Yes	
North Gate	Subsurface disposal	Office, 1 Home	No	Yes	
North Portal	-[1]	-[2]	-[2]	-[2]	-Served by the Town of North Portal sewage system
Oungre	Spray jet	1 home, 2 house trailers	Yes	Yes	
	Subsurface disposal	Office	No	Yes	
Regway	Spray jet	3 homes, office 3 trailers	Yes	Yes	
Torquay	Spray jet	2 homes	Yes	Yes	
	Subsurface disposal	Office	No	Yes	
West Poplar River	Spray jet	Office, 2 homes	Yes	Yes	
Willow Creek	Spray jet	Office, 1 home	Yes	Yes	

1 See Comments
2 Not evaluated/applicable
* Confirm compliance status (see text)

FACILITY (location)	SYSTEM TYPE	FACILITIES SERVED	SURFACE DISCHARGE	SATISFACTORY COMPLIANCE STATUS	RECOMMENDATIONS/ Comments
Royal Canadian Mounted Police					
LaRonge Detachment	Holding tanks	Detachment office, cell block, officer quarters	Yes	Yes	-Effluent hauled to Town of LaRonge lagoon
TRANSPORT CANADA					
LaRonge Airport	Holding tanks	terminal, shop	Unknown	Yes*	-Ensure proper disposal
North Battleford Airport	.1	.2	.2		-Served by the City of North Battleford sewage system
Prince Albert Airport	.1	.2	.2	.2	-Served by the City of Prince Albert sewage system
Regina Airport	.1	.2	.2	.2	-Served by the City of Regina sewage system -Freeze-up of deicer fluid collection sump causes release to Wascana Creek -Modify deicer collection system
Saskatoon Airport	.1	.2	.2	.2	-Served by the City of Saskatoon sewage system
Swift Current Airport	Subsurface disposal	Hangar, terminal bldg.	No	Yes	-System covered with insulation to prevent freezing
Uranium City Airport	Septic tank	Maintenance shed, bunkhouse	Yes	Yes	-Discharge is remotely located
	Holding tank[1]	Terminal bldg.	Unknown	Yes*	-Ensure proper disposal
Yorkton Airport	Holding tank	Terminal bldg.	.2	.2	-Sewage collected by contractor
	Subsurface disposal	Maintenance garage	No	Yes	

1 See comments
2 Not evaluated/applicable
* Confirm compliance status (see text)

APPENDIX 2

AN EVALUATION OF SOLID WASTE PRACTICES

FACILITY	ADEQUATE SITE OPERATION AND LOCATION	OLD SITES ADEQUATELY CLOSED OUT	COMMENTS
AGRICULTURE CANADA			
Experimental Farm (Indian Head)	-[1]	-[1]	-Garbage taken to Indian Head dump -Incinerator used regularly for combustible waste
Shelterbelt (Indian Head)	Yes	Yes	-Fence needed
Melfort Research Station	No	Yes	-Ban open barrel burning and institute proper disposal (i.e. landfill or incineration)
PFRA Demonstration Farm (near Outlook)	-[1]	-[1]	-Garbage taken to Town of Outlook dump
PFRA South Sask. River Project (near Cutbank)	-[1]	-[1]	-Garbage taken to R.M. of Loreburn dump
Regina Research Station	-[1]	-[1]	-Garbage taken to Regina landfill
Scott Experimental Farm (Town of Scott)	No	Yes	-Waste oil and pesticide containers in site. Redirect pesticide cans to R.M. can collection depot and collect oil for recycling.
Swift Current Research Station	-[1]	-[1]	-Garbage taken to Swift Current landfill
CORRECTIONAL SERVICE CANADA			
Prince Albert Penitentiary	-[1]	-[1]	-Garbage taken to Prince Albert landfill
ENERGY, MINES AND RESOURCES			
Satellite Tracking Station (located west of Prince Albert)	No	Yes	-Redirect pesticide cans in site to R.M. can collection depot -Ban disposal of PCB containing fluorescent light ballasts in dump
ENVIRONMENT CANADA			
Batoche National Historic Park	-[1]	-[1]	-Garbage taken to R.M. of St. Louis dump
Cree Lake Weather Station (located near Cree Lake)	Yes[1]	-[1]	-An incinerator is used -No old sites were identified

1 See comments

FACILITY	ADEQUATE SITE OPERATION AND LOCATION	OLD SITES ADEQUATELY CLOSED OUT	COMMENTS
ENVIRONMENT CANADA (continued)			
Fort Battleford National Historic Park	-No[1]	-[1]	-Garbage taken to Battleford landfill -Ban disposal of PCB containing fluorescent light ballasts in dump
Fort Walsh National Historic Park (located near Maple Creek)	Yes	Yes	
Motherwell Homestead National Historic Park (located near Town of Abernethy)	-[1]	-[1]	-Garbage taken to Town of Abernethy dump
Prince Albert National Park	-[1]	No	-Garbage taken to R.M. dump -One of two inactive sites needs cover
Webb National Wildlife Area (located near Swift Current)	-[1]	-[1]	-Closed to public, thus, not evaluated
NATIONAL DEFENCE			
CFD Dundurn	Yes	Yes	
CFB Moose Jaw	Yes	Yes	-Fence needed
REVENUE CANADA CUSTOMS AND EXCISE			
13 custom stations (identified in Appendix 1)			-Garbage taken to towns/RM(s) dumps
ROYAL CANADIAN MOUNTED POLICE			
LaRonge RCMP Detachment	-[1]	-[1]	-Garbage taken to LaRonge dump
TRANSPORT CANADA			
LaRonge Airport	-[1]	-[1]	-Garbage taken to LaRonge dump
North Battleford Airport	-[1]	-[1]	-Garbage taken to North Battleford landfill
Prince Albert Airport	-[1]	-[1]	-Garbage taken to Prince Albert landfill
Regina Airport	-[1]	-[1]	-Garbage taken to Regina landfill

1 See comments

FACILITY	ADEQUATE SITE OPERATION AND LOCATION	OLD SITES ADEQUATELY CLOSED OUT	COMMENTS
TRANSPORT CANADA (continued)			
Saskatoon Airport	-[1]	-[1]	-Garbage taken to Saskatoon landfill
Swift Current Airport	No[1]	-[1]	-Nonburnable garbage taken to Swift Current landfill -Ban open barrel burning -Ban disposal at landfill of PCB containing fluorescent light ballasts
Uranium City Airport	-[1]	-[1]	-Garbage taken to Uranium City dump
Yorkton Airport	-[1]	-[1]	-Garbage taken to Yorkton landfill

[1] See comments